approach

DECEMBER 1981 THE NAVAL AVIATION SAFETY REVIEW

Some dangerous Christmas music

CAN you imagine Irving Berlin and Bing Crosby being listed as causal factors in an aircraft mishap investigation? Is it possible for Duke Ellington's music to jazz an AT3 to death with electricity while he's repairing a piece of avionics gear? Turn down the volume and listen. MS2 Robert T. Seim, of VA-304, recently sent a letter to *APPROACH*, informing us not of the birth of the blues but of the birth of a new safety hazard — **self-contained stereo headphones** that limit a person's "outer" hearing and attention levels.

"These headphones are worn on flight lines (during both day and night check), in aircraft, in maintenance workspaces, on ships, virtually everywhere. I have personally witnessed two near-disasters that could have left a service member severely injured or even killed."

If you find one of these portable headphone sets lying under your Christmas tree, exchange it for a new necktie. Make a lamp out of it. Bury it in your backyard, and see if it grows into an orchestra next spring. But don't make it part of your flying equipment.

Music is designed to steal our attention, and we can't afford to breeze with George Benson, rhyme with Paul Simon, or flow with Al Jarreau when we're walking to our aircraft, preflighting, trouble-shooting, or flying.

The flight line area is of special concern. It's just too easy to forget that parked aircraft and overblown yellow cartoons like NC-5s, NC-8s, and NC-10s are the dangerous stuff that nightmares — and mishap reports — are made of.

Inattention has already been the cause of far too many gruesome propeller accidents, GSE mishaps, and jet intake ingestions. MS2 Seim is correct in predicting that if a solution to this problem is ever found, "it could save the Navy millions of dollars in injury settlements, equipment-damage repairs, and lost man-hours."

Even more importantly, it could save a life. It's something to remember while we're dancing under all those sugarplums.

LT Colin Sargent

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The AV-8B Harriers on the cover were painted by R. G. Smith. Courtesy of the McDonnell Douglas Corporation.

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Settling Siblings

Helicopter Whoas!

WEIRD title you say? Perhaps. But no more so than the subject at hand. The subject is failure. Specifically, it's the failure of a helicopter to **stop** when so commanded by its pilot. *Settling-with-power* is one of the siblings. *Power settling* is the other, and each has portended woe for many a pilot. While the results of an encounter with either will likely be the same, the mechanisms involved may be different. I say they *may* because it depends on whose definitions of the terms you're using when describing these conditions. Let's take a look.

By Maj J. P. Cress, USMC
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If you are a Pensacola graduate working to upgrade your FAA helicopter ratings, you've probably noticed that Uncle Sam associates the term settling-with-power with conditions different from those taught you while working toward your "wings of gold." In Advisory Circular (AC) 61-13B, the FAA defines settling-with-power as "a condition of flight sometimes described as settling in your own downwash . . . the helicopter is descending in turbulent air that has just been accelerated downward by the rotor." Similarly, the U. S. Army's FM 1-51 states that "Settling-with-power is a condition of powered flight where the helicopter settles in its own downwash. The condition may also be referred to as the vortex ring state."

Seagoing helicopter pilots will not likely find a definition of settling-with-power (SWP) in a NATOPS Manual, though they hear the term often in flight school. Still, many Marine and Navy fliers see SWP as a condition of settling which results when a pilot attempts to perform a maneuver requiring more power than is available. While this too may result in a helicopter smiting the ground (an implied possibility in the earlier definitions as well), there is no reference to settling in downwash or turbulence, nor does it refer to the vortex ring state. Your NATOPS does discuss something called power settling (PS), however. You'll find it back in Section IV, and the definition of PS probably reads something like: "Power settling occurs only when the helicopter rotor is operating in a rotary flow condition called the vortex ring state . . ." or "power settling occurs when the helicopter sinks into the air mass it has just displaced" or "power settling is the result of settling into a disturbed air mass." You'll agree that our PS and the FAA/Army SWP look a lot alike! Let's assume for the remainder of our discussion that PS involves disturbed air masses, vortex ring states, etc., and that SWP occurs when the pilot tries to do something which demands more power than he has.

What are some flight maneuvers that lead to conditions which fit our "navalized" definition of SWP? How about a tight, level turn? As bank angle increases, so does G and power requirement. Clearly a point can be reached where power demands exceed available power, and the turn is no longer level. How about a quick stop from a heavy, high-speed, low-altitude condition while approaching a landing zone which has come up sooner than expected? The nose comes up and the power goes down as the landing zone rapidly approaches. The pilot, now at zero forward speed over the zone, pushes the nose level and pulls an armful of collective. The aircraft sinks alarmingly, though full power has been demanded and the "book" indicates more than HOGE (Hover Out of Ground Effect) capability. How about a low-altitude pullup followed by a descending turn to target (perhaps with throttle "cracked" as a precaution against rotor overspeed)? The sink rate developed and altitude lost upon rollout might be considerably more than expected due to time lost as the engine "spools up" from the low collective/ throttle settings imposed at midmaneuver. The last (and perhaps the most obvious) case fitting our definition of SWP is that of the approach to a landing zone at a high gross weight/high density altitude condition. Let's compound the problem with a long external pendant which precludes hovering in ground effect, or let's consider a landing zone surrounded by trees or high obstacles which not only precludes an IGE (In Ground Effect) hover, but also denies the pilot use of the wind during the final, vertical descent to touchdown. In this case, as the pilot reduces speed and flies up the back side of the power-required curve, he may well find himself in a condition demanding OGE power with only IGE power available. As a result, the aircraft will settle *with* power (it just so happens that there isn't *enough* power!).

So much for SWP. What about power settling (PS)? How is it different from SWP? When and why does it happen, and how do you get out of it once you're in it? First of all, while most SWP cases involve low forward-flight speeds, low speed is not a prerequisite. Depending on what you're doing with the aircraft, you can run out of power (SWP) at any speed. In PS, however, low forward speed is fundamental. Secondly, conditions conducive to SWP result in uncommanded descent, whereas a fairly healthy descent rate (we'll quantify it later) *must first exist* before PS will be encountered. Finally, SWP requires either reduced power available, high rate of descent, high gross weight, high density altitude, high G, or some combination thereof. While some of these variables may increase the likelihood of PS, only rate of descent is essential to it.

We've mentioned that low speed and reasonably high rates of descent (ROD) are the ingredients of PS. But to get to the "nitty gritty," we first have to take a quick look at some basic momentum theory and a little arithmetic. Specifically, before we can go any further, we must agree that helicopter rotors produce downwash, and then we must compute what average downwash velocities are, because the forward speeds and RODs that lead to PS are very much a function of downwash velocity. On the first point (that downwash exists) there is surely no argument. As far as computing the average downwash velocities, that's no more difficult than working the following equation (for single-rotor helicopters):

$$V_i = \sqrt{\frac{W}{2\rho\pi R^2}}$$

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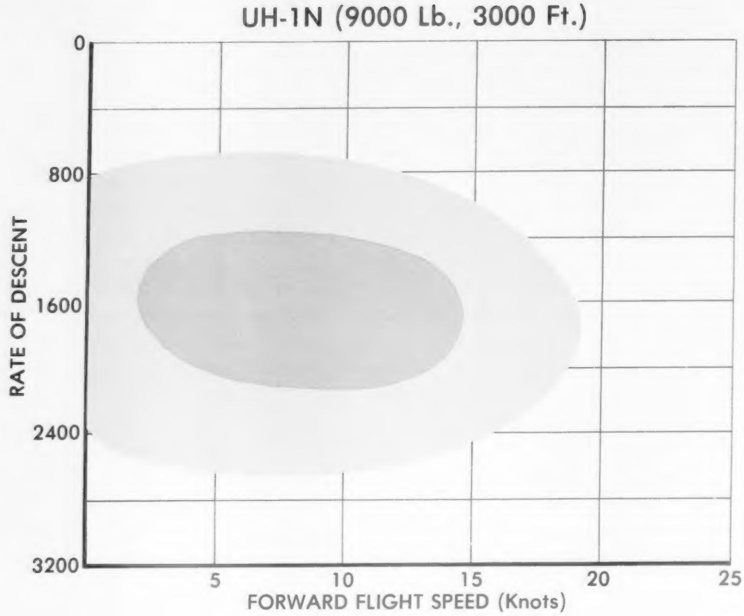

Fig. 1

What is all that stuff? Well, it is what we're looking for – average downwash velocity. W is the gross weight of the helicopter, ρ is the ambient air density, and R is the rotor radius. Let's not worry too much about the niceties of the equation as long as we agree that we know what goes in it and that, given a calculator, we could figure it out. (By the way, if you did so, you'd find that typical average downwash velocities are on the order of 40 feet per second (2,400 fpm). Remember, however, that these are average figures. Downwash velocities toward the tips and in the wake of a fairly heavily loaded rotor can exceed 135 fps (80 knots).)

Why bother you with the arithmetic? Again, because a peculiar set of forward speeds and RODs, dependent on average, induced velocity, is a prerequisite for PS, and the equation helps determine what the velocity variables are. But let's get on with it now and put the information in a form that might make sense in a cockpit. In Fig. 1 you see a power settling "map" for a UH-1N at 9,000 pounds gross weight and a density altitude of 3,000 feet.

You'll notice, in looking at Fig. 1, that two shaded regions are depicted. The outer area defines a condition of less severe power settling, while the inner region delineates a boundary of severe PS. Note that the less virulent strain of PS occurs over a range of RODs from 700 to 2,600 fpm and forward speeds from 0 to 19 knots, while the inner (severe) region corresponds to an airspeed range from 2 to 15 knots over a vertical speed spectrum of 1,100 to 2,100 fpm. (As we saw in the equation, these speeds obviously change with gross weight and density altitude.) It is also clear from Fig. 1 that the RODs and TASs conducive to PS are associated with steep flightpaths, ranging from 50 to about 80 degrees for flight within the inner boundary. Oddly enough, the data (both experimental and flight test) indicate less severe PS in a purely vertical (90 degree) flightpath than along a slightly inclined one.

"Great," you say. "We now know what speeds and angles lead to PS for a 9,000-pound *Huey* at a D. A. of 3,000 feet. But what does or doesn't the machine do when I put it in a

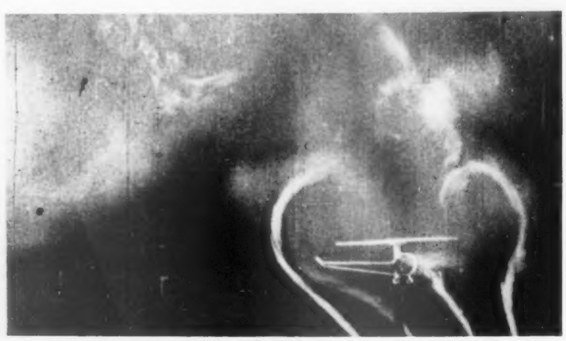

Fig. 2a

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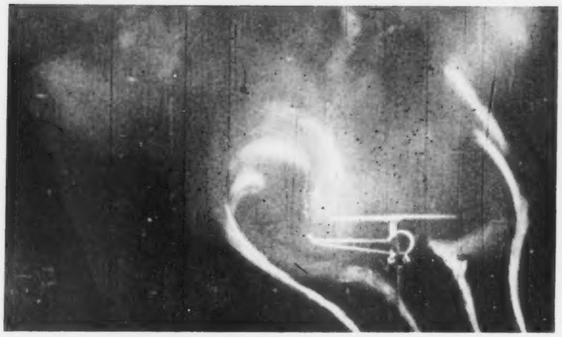


Fig. 2b

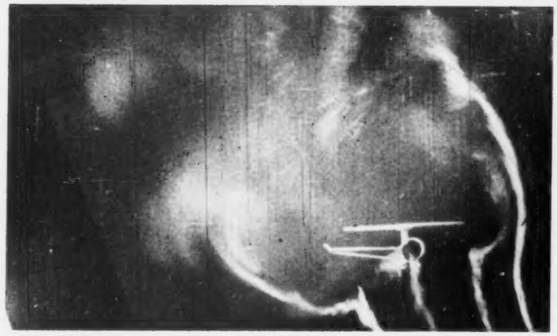


Fig. 2d

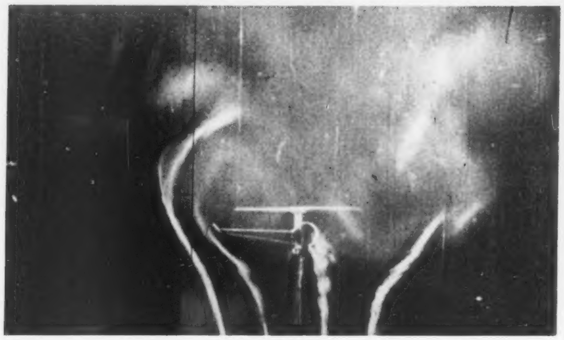


Fig. 2c

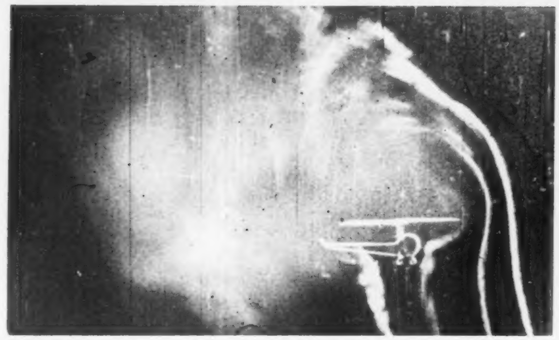


Fig. 2e

PS region?" A look at your NATOPS and Figs. 2a through 2e will refresh your memory. The manual suggests that in PS apparently uncontrollable descent may occur and that the ride will be a rough one, with a limited control response. The figures bear this out. PS occurs when the ROD approaches the speed at which the rotor blade tip vortex cores propagate downward from the rotor, i.e., the rotor settles into its own downwash. The result is the formation of an air body or "bubble" of air around the rotor in which the shed tip vortex system is held close to the rotor. The vortices, which increase in severity at lower forward speeds, cause very high downwash velocities on the outboard regions of the rotor disc. What does this mean to the folks in the cockpit? Maybe Fig. 3 will give you a feel for it.

Continued

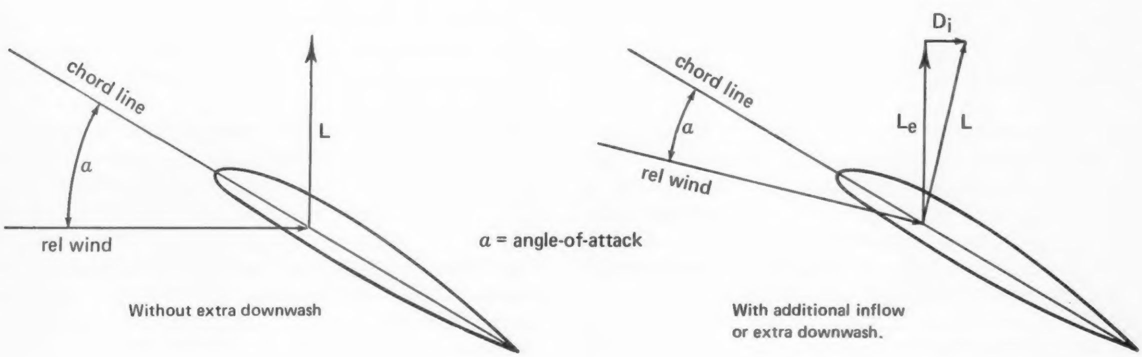


Fig. 3

In comparing the illustrations, you'll note that, at constant collective (incidence), the blade section experiencing the high downwash velocity sees a smaller angle of attack and thus produces less lift than in the reduced downwash case. Not only is the lift vector smaller in magnitude, but it is also tilted aft of vertical. Thus, the vertical component (effective lift) is even smaller, and the horizontal component (induced drag) is proportionally greater than in the lower downwash case. Obviously, if the pilot pulls collective to make up for this loss of lift, tip vortex strength and induced drag will increase. Some studies have shown induced power (power required to overcome induced drag) is on the order of 200 percent higher in the vortex ring or PS flight condition than in a normal hovering state. The obvious implication is that a power pull while descending in the vortex ring state (PS) may well lead to a much greater power requirement. The pilot who tries to bail himself out of power settling with up collective may see results even less to his liking.

In addition to high rates of descent (some test reports indicate RODs as high as 6,000 fpm developing prior to recovery), NATOPS suggests that the pilot can expect that his difficult-to-control descent will also be a bit bumpy. The reason for this may again be apparent in Figs. 2a through 2e. From these photos, you might start to get the feeling that the air body or "bubble" surrounding the rotor in the PS condition is always changing. That alone helps in understanding the expected roughness. The effect of the changing air body on the fuselage, rotor, and tailrotor can be considerable, causing erratic pitch, roll, and yaw excursions (and exhaust ingestion) quite *unsettling* to the pilot. Despite these apparently random responses, however, the air body seems to change in a periodic fashion, completing one cycle every several seconds. It has been theorized that this oscillating rotor flow is caused by successive filling and "bursting" of the air body, and smoke flow studies seem to support this hypothesis, as does rotor response.

Recall that two regions of PS were shown in Fig. 1. The outer region (less severe) is one in which rotor thrust oscillates 15 percent above and below mean value due to the "bursting" air body, while the inner (severe) region is characterized by thrust fluctuations of ±30 percent! Looking on the bright side, it's clear that flying in the vortex ring will challenge a pilot to a degree known by few living aviators. It's guaranteed to increase your attention span – at least once.

Does this stuff happen in the "real world"? In the past 2 years, we Navy/Marine Corps types have lost no less than four aircraft and five lives due to what we could call settling-with-power, and none of these mishaps involved any mechanical problems. While incidence of power settling (vortex ring state) is less frequent, it is known to have claimed one of our aircraft and quite possibly a second over the past 2 years. The first, an instrument flight (which was being filmed at the time of the mishap), involved a light aircraft executing intentional, vertical descents in cool, sea-level conditions. The second aircraft crashed after terminating an emergency descent with a steep approach at a higher than normal rate of descent. In each case, power available exceeded power required by several hundred horsepower, and maximum collective demand was made by the pilots, well prior to impact. Fortunately, in each case, the damage involved fewer bones than bulkheads.

The "settling siblings" and their results are not new, but some of our helo flight environments and tactics are. Consequently, we occasionally find a new technique for breaking a bird in an old way, but the solutions to the "siblings" are unchanged.

TO PREVENT SETTLING-WITH-POWER:

- Avoid excessive maneuvering, particularly in high-hot or heavy-marginal power situations, when close to the deck.
- Avoid high rates of descent close to the deck, particularly when making large power/throttle changes, and be aware of time lost in "engine spool-up" when arresting high rates of descent.
- Be cognizant of density altitude, gross weight, wind, obstacles and wind obstructions, and the interplay of translational lift, ground vortex, and ground effect on takeoff and landing.

TO STEER CLEAR OF POWER SETTLING (VORTEX RING STATE):

- Avoid low forward-speed/high rate-of-descent (i.e., steep) flightpaths.
- Remember that roughness, degraded control response, and increasing rates of descent during steep approaches may intensify when countered with increased collective.
- Remember that early recognition of power settling symptoms is essential due to the descent rates encountered and altitude required for recovery if the condition is allowed to develop.
- Remember that the only "sure-fire" cure for this vortex ring state (other than avoiding it) is to increase forward speed and reduce collective (ground clearance permitting) so as to enter an autorotation from which a normal recovery can be effected.

Note: *Power settling "maps" similar to Fig. 1 have been graphed for each of the current fleet aircraft in the Navy/Marine Corps inventory. Limited copies are available from the Safety School in Monterey. NATOPS/safety officers may send requests for copies to:*

Aviation Safety Programs (Code 034CE)
Naval Postgraduate School
Monterey, California 93940

A field in sight vs. <u>The</u> field in sight

By LT Timothy H. Wieand
VP-31

AS copilot a few days ago, I witnessed an approach and landing to a field I'd flown to several times during the past 5 years. This particular approach, while "uneventful," splashed water in the face of a memory that had been dozing within me for quite a while.

About 2 years earlier, I'd been in a situation so similar that I now couldn't help but feel a little of that fabled sense of *deja vu*. The first time around, we'd arrived at the IAF of the busy terminal area moments after sunrise, only to find things were slow with Approach Control because of the early hour. The morning was oddly sunny. Although I was alert, I knew I was beginning to tire after being up all night. We would end up logging just over 8 hours of flight time and would be heading back home in about 36 hours. I was thinking of how nice it would be to park the airplane and relax.

We were cleared for the TACAN approach and, in a few minutes, would be landing. We were turning final with the wheels down and the checklists complete. The approach for which we were cleared took us over an airport with its runway oriented within 30 degrees of the destination runway and located inside the final approach fix (FAF) for the TACAN approach we were executing.

Just outside the FAF, Approach Control handed us over to Tower. While I was changing frequencies, the pilot called, "Field in sight!" Well, with very little imagination, you can guess what happened. For my part, I recall that I made some inane remark like, "This sure seems a lot closer than 7 DME." Anyway, my buddy in the left seat saw his chance to put the machine on the ground, even though the DME did not "sync up" with what was published. After all, it was such a beautiful morning, *and the field was in sight.*

I gave Tower a call, reported the wheels down, and requested landing clearance. We immediately received clearance to land and began to line up. I didn't feel comfortable with what I saw, but for a couple of seconds, I didn't put it together. I suspect that the tower operator had seen this "movie" before, because he quite emphatically called us "Not in sight!" Each pilot caught on about the same time, but not a moment too soon. We both reached for the power to avoid continuing an approach to the wrong field!

Nothing ever came of what happened that morning except that two experienced pilots realized they had come closer to a high-visibility "Delta Sierra" than they would be willing to admit. Earlier in the flight, I remember discussing the existence of the second airport, but neither of us was properly oriented during the approach.

So what's the point, you say? Maybe that timeworn expression, "There's those that have and those that will!" best applies. At home, I have a plaque on my "I love me" wall. It reads "Good judgment comes from experience; experience comes from bad judgment." Doublecheck that runway rising irresistibly up to your wheels on final approach. It could save you a lot of embarrassment (as well as a possible midair!).

Yuletide recollections of an ASO

A Christmas Airol

The article below is fictional, but the anecdotes which appear are loosely based on happenings gleaned from squadron flight reports, happy hour horror stories, vivid and not-so-vivid recollections, and everyday conversations. The names have been changed to protect the guilty as well as the innocent.

By Russ Forbush

'TWAS 0600 on a December morn when the alarm clock released its ear-piercing message – "It's time to arise, LT Gutz." With that shrill reminder, our peerless ASO lazily reached over with his left hand and violently choked the alarm to a screeching halt. He sat up in bed, rubbed his blood-streaked eyes, noted that his wife was still asleep, and then arose and headed for the head. Not wanting to disturb his better half, he left the bedroom light off. As he groped his way through the darkness, his left big toe suddenly made contact with the edge of the closet door. LT Gutz, hobbled by pain and suffering, felt impelled to fill the air with not-so-Christmasy invectives. "Oh God," he thought to himself, "not another year like last year!"

No sooner had this thought entered his mind, than a muffled, gravelly voice from behind said, "I am the Spirit of Yuletide Safety Past, and I have come to escort you on a tour of your Holiday Season last."

Hearing those words caused LT Gutz to cringe. "Please, dear Spirit of Yuletide Safety Past," he implored, "spare me the pain of having to return and witness those horrible safety sins." He then turned and faced the eerie ghost, who was clad in rumpled parachute cloth and adorned with rusty tiedown chains. One look into the IMC eyes of the Spirit, however, convinced the ASO that further pleading would go for naught. He thus resigned himself to the fate which was about to befall him and joined his tour guide for the journey back to the preceding year.

"We have arrived at the first stop," the Spirit said to LT Gutz. He then waved aside the billowing fog which encircled the pair. As the atmosphere cleared, the ASO looked ahead and saw a car proceeding along a highway. When he looked at the driver, he realized it was himself, and he was on his way to the NAS to commence another day of work.

"Geez, I remember that," Gutz mused. "I'm a little heavy on the gas pedal – too many turns. Oh no, there's the red flashing light – where in hell did that police car come from? No sir, Officer, I'm not in any hurry. You say I was doing 50 in a 35 mph zone? I sure didn't think I was going that fast! Heh, heh, you don't give out tickets during the Holiday Season do you? You do! Yeah, I won't forget to show up in court." (The thoughts that now surged through LT Gutz's mind are unprintable.)

"Now walk over there and glance downward," the Spirit directed.

The ASO slowly made his way to the area, and when he looked down, his eyes were riveted to a gravestone and its inscription, which read in part, "Here Lies LTJG Jacob Barley." The ASO paled as he remembered that awful night when his good buddy caused a midair collision and failed to eject. This had occurred on his third flight of the day.

"Why didn't you get yourself grounded?" LT Gutz asked out loud. "You had that bad cold, and you were stuffing yourself with a cold remedy," the ASO continued. "Either of those were cause for grounding. You'd probably still be with us if you had listened and heeded the flight surgeon when he lectured about medicating and flying." As LT Gutz backed away from the gravestone, his eyes filled with moisture, and with a lump in his throat, he whispered, "We miss you, Jake."

"We have one more place to visit before I turn you over to the Spirit of Yuletide Safety Present," the Spirit said to LT Gutz. "Peer through that window in front of you." The ASO then realized his nose was flush against the window pane. As his eyes focused on the interior of the room, he spotted LCDR Tim Longfellow. Tim, perched atop a wooden crate which was resting on a rather unstable coffee table, was putting the finishing touches on his floor-to-ceiling Christmas tree.

LT Gutz looked on in disbelief. "Get down off that crate before you bust your butt," he roared forth. But, of course, it was to no avail, since Tim couldn't hear him. As the lieutenant commander placed the star on top of the tree, the crate gave way, and Tim hurtled into the tree and then onto the floor below. His impact with the tree placed stress on the frayed electric cord, and it short circuited, igniting the tree limbs on the bottom. Longfellow's wife heard the commotion and rushed into the room. Seeing the fire, she raced back into the kitchen, removed a fire extinguisher from its holder, rushed back into the living room, and drenched out the fire. She then called an ambulance and had her husband transported to the NRMC. Poor Tim broke his left arm and leg and hobbled around on crutches for some time.

When the ASO turned to face the Spirit Past, he was gone, but he could hear a clanking of chains nearing his position.

"I am the Spirit of Yuletide Safety Present, and I will be your guide for this segment of the journey," declared the high-pitched, raspy voice.

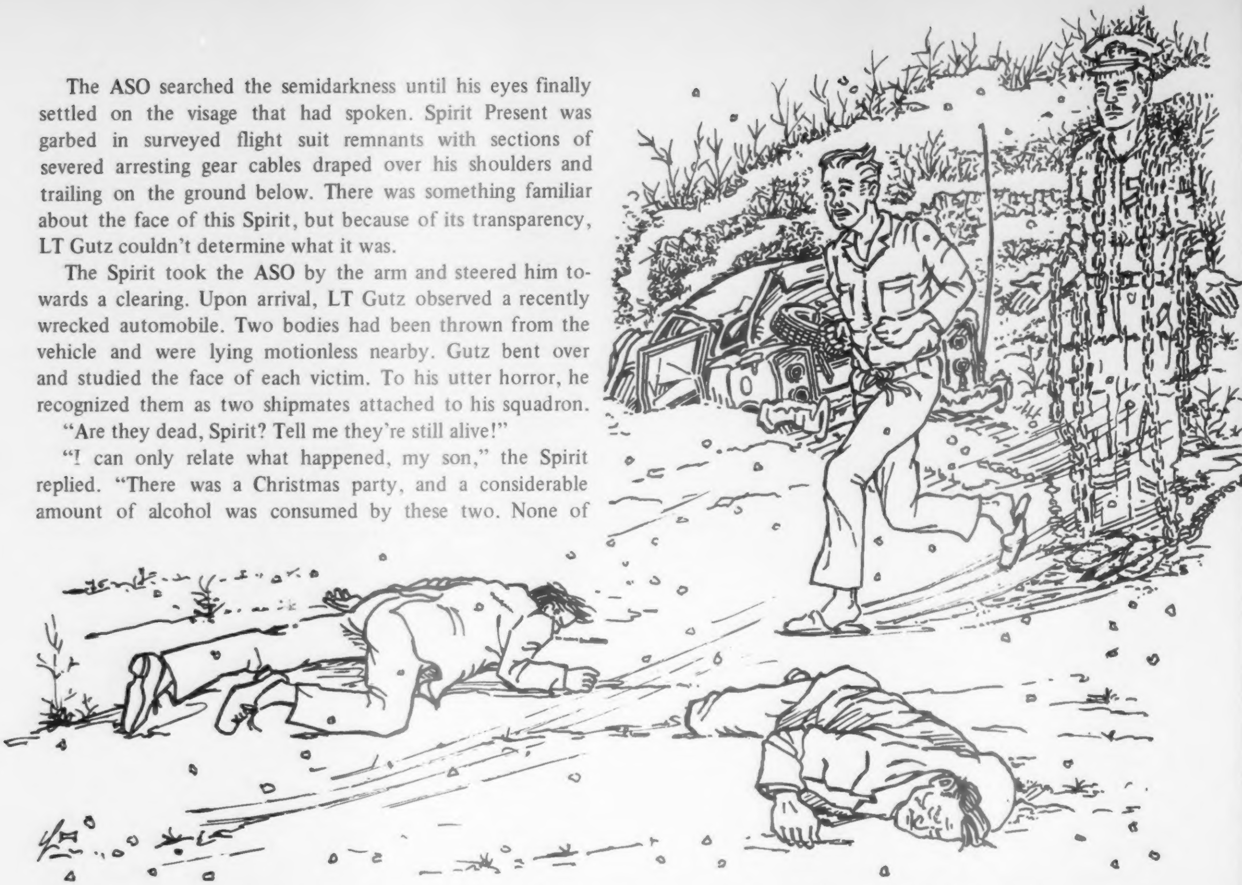
Continued

The ASO searched the semidarkness until his eyes finally settled on the visage that had spoken. Spirit Present was garbed in surveyed flight suit remnants with sections of severed arresting gear cables draped over his shoulders and trailing on the ground below. There was something familiar about the face of this Spirit, but because of its transparency, LT Gutz couldn't determine what it was.

The Spirit took the ASO by the arm and steered him towards a clearing. Upon arrival, LT Gutz observed a recently wrecked automobile. Two bodies had been thrown from the vehicle and were lying motionless nearby. Gutz bent over and studied the face of each victim. To his utter horror, he recognized them as two shipmates attached to his squadron.

"Are they dead, Spirit? Tell me they're still alive!"

"I can only relate what happened, my son," the Spirit replied. "There was a Christmas party, and a considerable amount of alcohol was consumed by these two. None of



their shipmates took strong initiative to have a nondrinker drive them back to the base, and they were allowed to drive off on their own. The driver failed to negotiate that curve over there, and the car hurtled into this clearing. Their ultimate fate will not be known until this night is over. Come with me, for there is more for you to see."

Forlornly, LT Gutz fell in at the Spirit's side, and the journey continued.

The ASO began to hear muted voices, and as the area in which he was standing began to light up, he realized he was in the NAS Control Tower. The first snow of the winter season had fallen the day before, and although the runways had been cleared, there were several ice patches on them from the cold. A tower operator was in communication with one of LT Gutz's squadron's aircraft, which was on the downwind leg of the traffic pattern. The aircraft commenced the 180-degree turn, reported all checks completed, and had its wheels down and locked. The aircraft was now on final and nearing the runway threshold.

"Damn it, he's too fast," the ASO thought to himself. "With ice on the runway, braking is going to be critical."

Sure enough, as the aircraft headed down the runway and the pilot initiated braking action, the mainmounts rolled onto a patch of ice, and the aircraft began to swerve to the right. It continued in a right heading until the right main contacted a runway light and collapsed. The aircraft then made two 360-degree turns through the snow before coming to a stop. There was considerable aircraft damage, but the ASO noted the crew egressing the bird, which indicated no one was injured, at least not seriously.

"Why didn't I hold that AOM on cold weather operations," Gutz chided himself. "I don't know whether it would have prevented that accident, but it sure would make my conscience feel better."

Upon exiting the tower, the Spirit escorted the ASO toward his squadron spaces. En route, the Spirit asked, "Have you started to put together a training program for your safety standdown next month?"

Gutz stammered a bit before replying, "Well, not really, I was waiting until after the holidays." The Spirit looked at him but said nothing further.

After entering the squadron admin building, the pair passed the officer's roster board. LT Gutz scanned the faces on the board until suddenly his eyes met those of his skipper in the photo. Then it hit him, the Spirit Present looked like the "old man." He wheeled to face the Spirit and make this known, but alas, he was gone.

Again, the ASO heard the clanking sound of chains approaching him. He turned his head towards the sound and observed a figure dressed in a black, flowing robe with a heavy metal chain around its neck and what appeared to be a large cross suspended from the chain.

The figure spoke. "I am the Spirit of Yuletide Safety Future, and you will join me for the conclusion of your tour. I have but one place to take you, so let us be on our way."

Shortly thereafter, LT Gutz saw that they were nearing a small building. He heard the strains of an organ playing a religious hymn. The Spirit guided the lieutenant through the door of the building, and once inside, the ASO found himself standing in the main aisle of the base chapel.

"What are we doing in this chapel?" Gutz asked the Spirit.

"Listen, and you will find out," the Spirit replied.

LT Gutz watched as a Navy chaplain, standing before the pulpit, began to speak. "We are gathered in a service of worship today to commemorate a fallen comrade, LT Manley Gutz."

Those words reverberated through LT Gutz's mind like a shock wave. "Why me, Spirit?" he asked. "I'm too young to die – I have a wife and family to care for – I have many things to accomplish in the future. Tell me this is not me, that this is not true – please, please, please!"

"Manley! Manley! What are you doing? You're tearing your pillow to shreds, and you're soaked with sweat! Are you having an attack of some sort?" his wife Dorothy asked.

LT Gutz quickly sat up in bed and began to feel his arms and legs and then looked at his wife and asked, "Is it really me? Am I alive?"

"Of course you're alive. Why wouldn't you be?" his wife answered.

"What day is it?" he asked.

"What's the matter with you, Manley? Don't you know it's Christmas morn?" When he heard those words, the ASO leaped out of bed, ran and opened the bedroom window, and shouted out, "Merry Christmas, Merry Christmas, to one and to all!"

Gutz's next door neighbor was privy to this unrestrained burst of enthusiasm and thought to himself, "The poor lad must have drained the eggnog container last night."

The ASO then remembered the accidents he had witnessed during his woeful journey. He raced to the telephone next to the bed and dialed his squadron duty office.

"Jim, this is Manley. Have we had any car accidents involving death or injury? We haven't? That's outstanding! Did one of our aircraft skid on a runway and get banged up? Not a one! How sweet it is! One last question. Jake Barley wouldn't be around, would he? Yeah, I remember what happened last year – I guess I was just hoping. No, I'm okay. Maybe I'll tell you about it sometime. Look, have a very Merry Christmas . . . Thanks, you'd better believe I will."

LT Gutz sat on the edge of his bed with his head nestled between the palms of his hands and meditated about the future and the work he must do. The first thing is to get hold of the February '81 issue of *APPROACH* magazine and reread the article entitled "Safety Standdowns – Where to Go for Help." An AOM on cold weather ops and an all-hands update on the importance of not speeding or drinking and driving are also musts, and there are a number of other safety topics due for review. Yep, he has a lot of work to do – **doesn't his future depend on it?!!** ◄

"Look, Ma, no

THIS catchy slogan drew guffaws and chuckles from those who observed a C-130 making landings aboard USS FORRESTAL (CV 59) back in 1963. Not so with a recent incident with one of our A-7 *Corsairs*! Except for some fine airmanship from a junior naval aviator, it could have resulted in a serious mishap and the loss of a valuable LATWING asset.

An A-7E had been embarked for a 2-week refresher buildup for the EASTPAC squadron. During this period, it became necessary to cannibalize parts from the *Corsair* (while it was in phase maintenance) to support other aircraft on the detachment. The PC-2 hydraulic pump, filter bowl, main generator, and belly pan were removed, and replacement parts were put on order. The aircraft was designated by Maintenance Control to fulfill a squadron commitment as a static display during a forthcoming dependent's day cruise, and the junior squadron pilot was assigned to fly the aircraft back to Homeplate following the display.

The ship arrived in port on schedule, and the beach detachment began installing the replacement parts. The belly pan was received from the CV's AIMD, and the first glitch occurred when it was discovered that holes for installing the tailhook mechanical uplock bolt were misaligned. At this point, the decision was made to install the belly pan "as is" and launch the bird to the beach with the tailhook held up by hydraulic pressure rather than the mechanical uplock. The aircraft was cleared for the one-time flight and readied for launch on the day of the dependents' cruise.

After one launch attempt was aborted due to a hydraulic leak near the PC-2 filter, it was discovered that the tailhook would not retract due to a flat tailhook accumulator. It was also determined that the accumulator could not be serviced, since all nitrogen pigtails had been offloaded with the squadron gear when the ship had arrived in port the previous day. Now, Maintenance Control was rapidly running out of options!

The following alternatives were discussed with the junior pilot (2 months in the squadron):

- Remove the tailhook and launch.
- Bolt the tailhook up and launch.
- "Down" the aircraft and offload it by crane after the dependents' cruise.

While the maintenance control officer and maintenance CPO were discussing the options with the skeptical pilot, the maintenance CPO took the bull by the horns. **He ordered the tailhook removed**, since the aircraft could not be moved below with the tailhook dragging. The rationale was that the hook would already be off if the pilot decided to launch without it, and launching with the hook bolted up was rejected as too high a risk should the bolt fail during the catapult stroke. With the precedent of a previous, CO-approved "one-time-flight" without a tailhook to the beach established, the pilot made his decision to press on and man the aircraft. The launch and short flight to Homeplate were uneventful, except for one very important item – you guessed it – a PC-2 failure prior to final approach!

Luckily, the pilot conferred with squadron personnel via base radio, extended gear and flaps using emergency systems,

hook!"

By Bill Peters
APPROACH Writer

kept his brow cool throughout an LSO-monitored field approach and landing, and brought the aircraft to an uneventful stop using residual utility braking and emergency wheel brakes. The possibilities for a disastrous conclusion to this mission are numerous and all too obvious.

There are 24 other inflight emergencies in the A-7E aircraft, besides a PC-2 failure, where NATOPS either specifies or suggests using field arresting gear. This squadron has an SOP which was misinterpreted by squadron maintenance personnel as condoning a one-time flight without tailhook to avoid craning off a "dud" aircraft. The SOP unfortunately did not get disseminated to all who were involved in making this maintenance decision. The CO subsequently alleviated any doubts in his command's collective mind concerning flying less than fully-equipped aircraft.

The operations and maintenance personnel of the command were briefed on existing policy regarding the qualifications necessary to conduct PMFC evolutions whether or not full PMFC procedures are required prior to reactivating a "hangar queen" into a fully operational status. The most experienced PMFC pilots will continue to be those assigned to perform the most demanding functional test flight duties.

Getting all aircraft flown off is always desirable from a maintenance standpoint. A crane offload at pierside is about the least desirable option and is a tempting reason to "bend" the rules, but sound maintenance practices and rigid conformance to SOP is necessary to avoid another incident such as this.

Wind Shear:
MOTHER NATURE

By LCDR Joe F. Torres, USNR-R
VR-57

The aircraft was on approach to NAS Southeast at 142 to 145 knots. The sky was partially obscured, visibility was 2 miles, and winds were variable at 12 knots. On final and commencing descent, the aircraft was in and out of clouds and light rain showers. At 3 miles, the crew sighted the approach lights and the first part of the runway. The remainder of the field was under dark clouds, and lightning was observed about 5 miles to the north.

Suddenly, the aircraft began increasing speed and rapidly drifting left of centerline. At 1 mile from the field, the aircraft was at 600 feet AGL and 185 knots. The crew commenced a waveoff.

The aircraft climbed through 800 feet AGL at 185 knots. The gear were up, flaps were at APPROACH, normal shaft horsepower was set, and the aircraft attitude was 5 degrees nose up. In the next instant, the aircraft's airspeed dropped to 140 knots, and the plane was headed for the ground. Using maximum power, the crew arrested the descent at 200 feet AGL. The crew then reported the phenomenon to the tower and requested clearance to holding. After switching back to Approach Control, the crew heard a report of winds gusting to 47 knots.

The CO's comments on the Hazard Report included the following line: ". . . this crew was not anticipating the conditions they encountered . . ." If they'd read the following article, maybe they would have.

at her WORST!

UNDOUBTEDLY, you have heard of wind shear. But what exactly is this powerful force of nature that can take a 100,000-pound aircraft flying 30 percent above stall and, in a short period of time, cause it to cease flying and impact the ground in a stalled condition?

It is defined as a rapid change in windspeed and/or direction (both horizontally and vertically) over a relatively short distance. Severe wind shears have occurred close to the ground, with speed changes up to 50 knots and direction changes up to 180 degrees.

Although wind shear can occur at any altitude, low-level wind shear is particularly hazardous. In this situation, usually 1,500 feet AGL or below, the aircraft is configured with gear, flaps, and slats extended. This presents a high drag, slow airspeed regime that makes the aircraft very vulnerable. Additionally, an aircraft's performance can be critically affected since lift depends upon the relative airflow over its wings. *Wind shear can directly change the dynamic pressure (q) and, consequently, the amount of lift being produced.* (Note the basic lift equation where $L = C_L qS$.) Other factors that have a bearing on wind shear effect are aircraft speed, aerodynamic characteristics, power/weight ratio, engine response, and the ability of the flight crew to respond.

An abrupt headwind increase can, in a very short time, create a rapid increase in indicated airspeed. On the other hand, an abrupt headwind loss (or rapid reversal in direction) can cause indicated airspeed to drop sharply. A problem obviously results when the *wind changes at a greater rate than the aircraft inertia can be appropriately accelerated or decelerated.* Consequently, aircraft performance can be dramatically affected, even to the point where it is no longer in a safe flight regime.

Wind shear may originate from frontal passage, land or sea breezes, jet streams, or thunderstorms. Of these, thunderstorms present one of the most hazardous low-level wind shear conditions. Wind shear patterns in and around a mature thunderstorm are extremely complex and often unpredictable. Thunderstorm-related wind shear can occur on all sides of the storm and in the severe associated downdrafts beneath the cell. Highly complex wind shear patterns of a more unpredictable nature can result when there are numerous mature cells in the vicinity.

Two basic types of potentially hazardous wind shear conditions are shown in Figs. 1 and 2. In Fig. 1, the aircraft is traversing from a tailwind to a headwind. Initially, indicated airspeed increases, the aircraft pitches up, and altitude in-

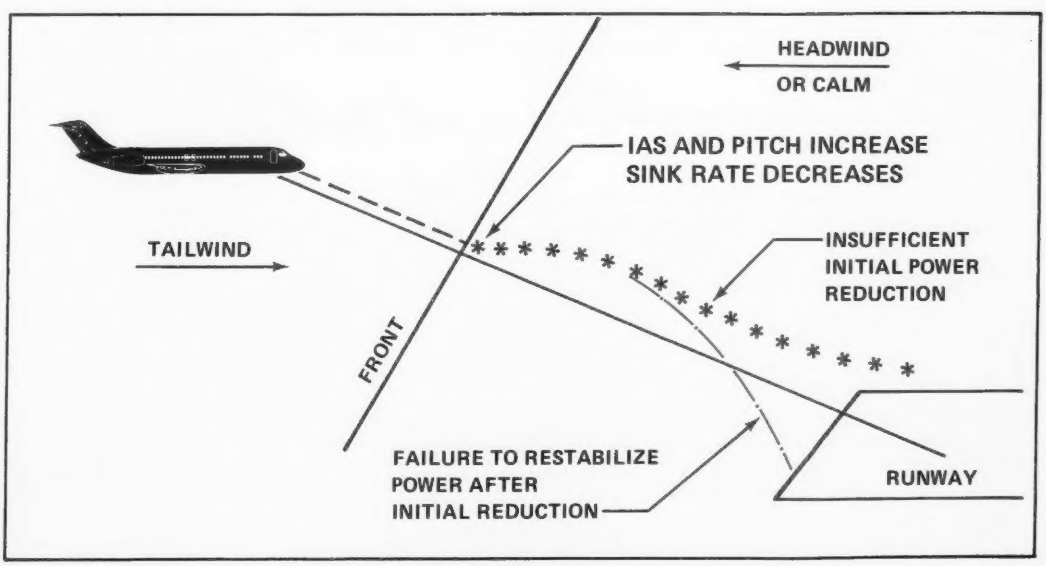


Fig. 1 — Tailwind Shearing to Headwind or Calm

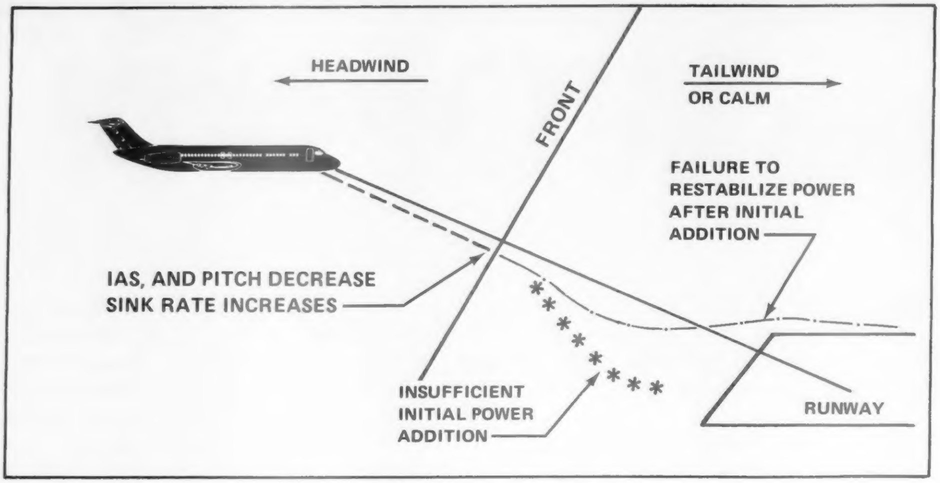


Fig. 2 – Headwind Shearing to Tailwind or Calm

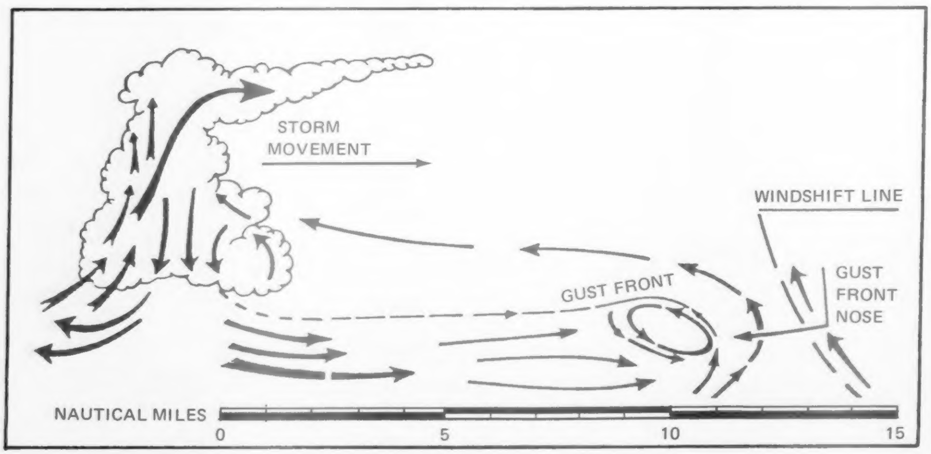


Fig. 3

creases. Figure 2 shows a headwind-to-tailwind situation. Here, indicated airspeed decreases, the aircraft pitches down, and altitude decreases. Although corrections are required in compensating for various wind shear conditions, countercorrections (or restabilization) are equally important to accomplish a safe landing.

Figure 3 shows the relationship of wind shear to storm movement and the associated gust front.

Figure 4 depicts a simplified example of a severe wind shear pattern generated by a mature thunderstorm in the vicinity of an airfield. An aircraft attempting to fly a normal instrument approach rapidly encounters an increase in indicated airspeed at Point A. As previously mentioned, this causes the aircraft to pitch up and gain altitude, thus deviating above the glide slope at Point B. Due to a faster approach speed and an above glide slope condition, normal pilot response is to reduce power and correct back to glide slope. As the headwind rapidly deteriorates, indicated airspeed falls off sharply, the nose pitches down, and the aircraft descends through and below the glide slope. This situation is further complicated by the severe downdrafts. At Point C, the aircraft is both low and slow, with the throttles at a reduced setting. Note the dramatic change in windspeed and direction over a relatively short distance, as well as the severe downdrafts on short final. As one can easily see, the aircraft is immediately placed in an *extremis* situation at Point C.

A composite National Transportation and Safety Board excerpt illustrates the severity of the problem: ". . . aircraft was inadvertently placed in some combination of severe downdraft and/or wind shear that resulted in high rates of

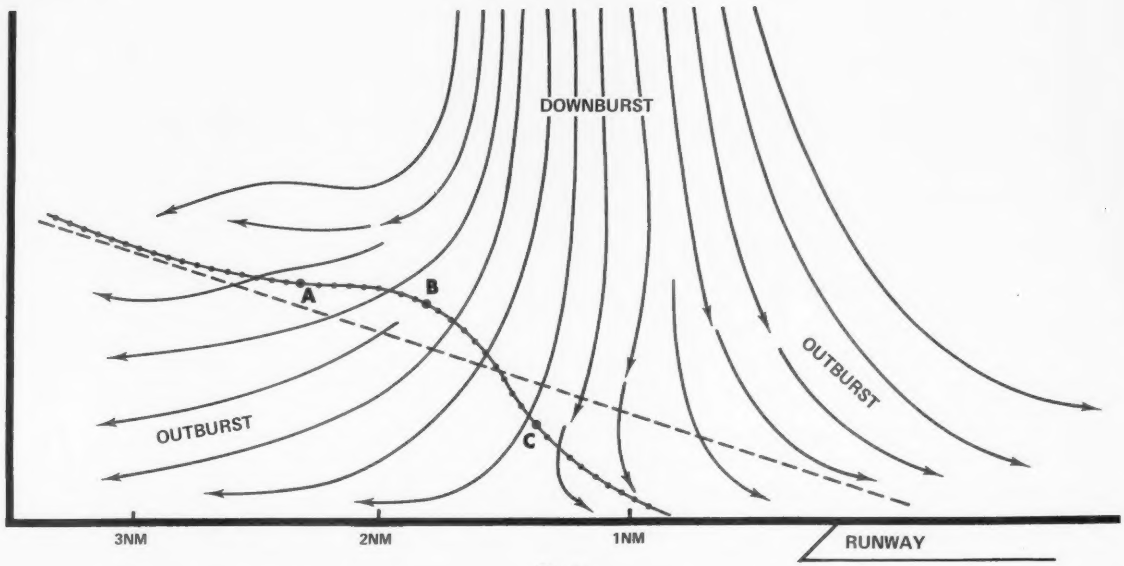
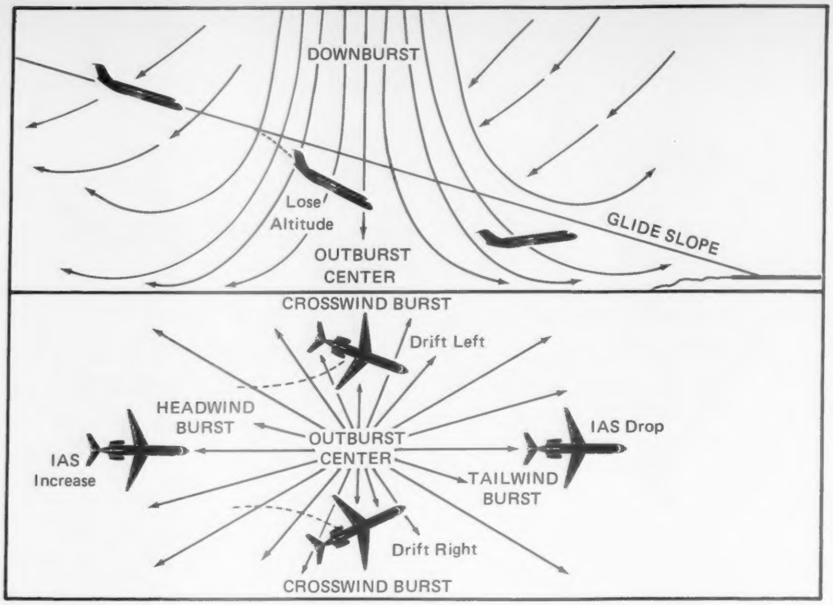


Fig. 4

Example of Gust Patterns Generated by a Mature Thunder Storm in the Vicinity of an Air Field.



Effects of downburst and outburst upon aircraft during a final approach. Of these the most dangerous one is the downburst, crosswind burst, and tailwind burst encountered near the ground. Outburst is defined as being the strong outflow created when a downburst hits the ground and spreads out.

descent and/or loss of airspeed when less than 500 feet AGL . . . impacted ground . . . short of runway . . ."

Other Related Phenomena. A recent study conducted by James K. Luers of the University of Dayton Research Institute concerning the effects of heavy rain on lift and drag has been highly publicized throughout the aviation community. The study itself, as well as follow-on articles, reported significant loss of lift and increases in drag while flying in an approach configuration in heavy rain. Officials at NASA Ames Research Laboratory, NASA Langley, and the FAA Technical Center are in unanimous agreement that this study may have significantly exaggerated the aerodynamic effects of heavy rain. The research conducted in this area is inconclusive, and further study by NASA is anticipated.

Until more complete data is accumulated, however, it would be unwise for any pilot to discount the possible adverse effects of heavy rain when combined with wind shear. These two weather phenomena are often encountered simultaneously, and it may be some time before their individual aerodynamic effects can be separated.

According to Dick Bray of NASA Ames, the effects of heavy rain depend on many factors. These factors include the Reynolds number and aerodynamic characteristics of an aircraft's wings, whether or not the wings have leading-edge slats, etc.

Our knowledge of wind shear and associated phenomena is still evolving. The material contained herein is by no means exhaustive. It does, however, contain some of the latest in source material and procedures from numerous publications. Awareness, understanding, and correct and timely pilot procedures should greatly eliminate the potential for this phenomenon to cause a catastrophe.

Our sincere thanks to Mr. Leo Garodz of the FAA Technical Center and Mr. Joe Chambers of NASA Langley for their assistance in staffing this article. –Ed.

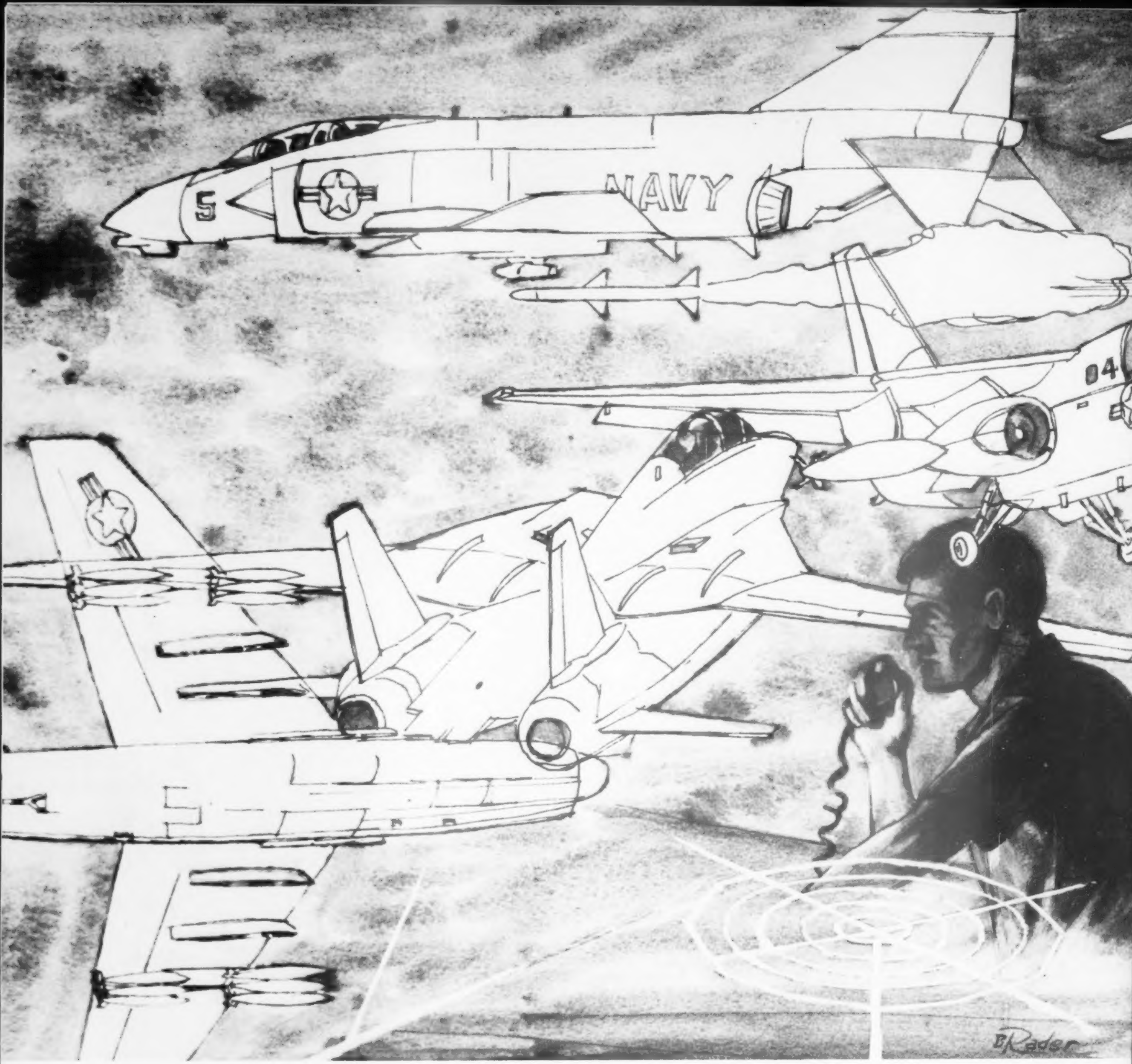
ENS Craig Miller

bravo zulu

INITIAL carrier qualifications in the T-2C *Buckeye* are always eventful flights and full of new experiences for the student naval aviator, but for ENS Craig Miller of VT-23, NAS Kingsville, his CQ-11 check provided more excitement than most.

After successfully completing three traps and two catapult shots on 22 August 1981, ENS Miller was primed and ready for his third shot aboard the USS LEXINGTON. With his T-2 *Buckeye* in tension on the catapult, all engine instruments indicated normal with all systems "go." Immediately after initiation of the stroke, a thump was heard, and just off the ship's bow, the T-2 began to shudder due to severe engine vibrations. The No. 1 engine RPM was observed fluctuating from 60 to 100 percent, and the EGT rapidly exceeded acceleration limits. After analyzing the situation, ENS Miller immediately raised the gear, then shut down the No. 1 engine while maintaining MRT power on No. 2. ENS Miller commenced a single-engine climb at 110 knots, squawked emergency, and notified the ship of his problems and intentions. After climbing the T-2 to 3,000 feet, ENS Miller lowered the nose to obtain 135 knots (minimum airspeed for raising the flaps) and raised the flaps. He turned the limping *Buckeye* toward homefield, approximately 70 miles away, and was escorted home by a lead/safe aircraft. The return flight to NAS Kingsville proceeded uneventfully and ended with an "above average" single-engine landing. After shutdown, a visual inspection revealed massive FOD damage to the No. 1 engine.

A single-engine failure following a catapult shot is a demanding, precarious situation for an experienced naval aviator, let alone a student pilot. It took rapid decisions and a thorough knowledge of NATOPS procedures for ENS Miller to bring his aircraft back safely. ENS Miller's calm and quick assessment of the situation and his immediate response in the unfamiliar and highly-demanding carrier environment prevented the possible loss of the aircraft.



Cockpit Distractions

By Richard A. Eldridge
APPROACH Contributing Editor

YEARS ago, Navy and Marine Corps tactical squadrons were composed almost exclusively of single-piloted aircraft. Some aircraft carried additional crewmembers, but those fliers functioned primarily as radiomen, gunners, or mechanics. The fighter, attack, and helicopter communities did not enjoy the luxury of a second pilot, NFO, B/N, TACCO, or RIO occupying the cockpit and sharing the workload. (We are not excluding the multiengine patrol/transport communities, as two pilots in the cockpit have always been a fact of life there.) Now nearly all our firstline tactical aircraft have two or more crewmembers.

What has all this to do with cockpit distractions? Well, there is an oft-quoted adage to the effect that "two heads are

better than one." Relating it to aviation safety, particularly to having two persons divide the cockpit workload, it would seem indisputably true. The mere presence of a second person in the cockpit, however, does not necessarily guarantee an oversight will not occur during instances of distraction or stress.

Why do two aviators stay with an out-of-control F-4, after passing 10,000 feet, and ride it into a smoking hole with no ejection attempt? On a night GCA, what causes two aviators to acknowledge and comply with an incorrect altitude clearance that eventually causes them to become a mishap statistic on a lonely mountaintop? How does a night CCA terminate in a gradual descent into the water with neither crewman apparently aware of what is happening? Are the blind leading the blind when a wingman follows his leader into the ground, much to the horror of observers?

The examples go on and on. But why? Is it lack of experience? Poor training? Improper briefing? Lack of crew teamwork? Distraction?

Two heads are better than one only if the sensory addition is not discounted by subsequent aircrew relaxation. The need for total attention increases each day with our sophisticated, high-speed, and quick-reacting aircraft. As an effective fighter, attack, logistics, or ASW team, you must continually know what you and your aircraft are doing and, when a distraction arises, guard against interrupted habit patterns.

Distractions occur routinely, particularly on airway flights, due to task saturation and the all-weather requirement placed upon crews. Because of the workload, it is essential that cockpit occupants share the responsibility for task completion.

One of the most common distractions, the interruption of a habit pattern, has led to a type of mishap which is all too familiar to the military pilot – the inadvertent wheels-up landing. Although this type of mishap occurs much less frequently than it did 25 to 30 years ago, it does still occur. A typical scenario involves an aircrew who is directed by the tower to wave off on final approach, or who voluntarily waves off for whatever reason, and then routinely raises the landing gear. Unfortunately, too often, the checklist is overlooked on the second approach, because the crew's subconscious is secure in the knowledge that the checklist was completed the first time. When the second approach is made and the checklist is not completed again, the wheels-up landing occurs.

NASA recently published a study on pilot distraction, based upon their Aviation Safety Reporting System (ASRS), from reports voluntarily submitted by aircraft crewmembers and controllers. It concluded that human susceptibility to distraction is one of the most frequent causes of hazardous events in air transport operations. Although the study addressed only air transport operations, most of its contents are applicable to single-piloted or multicrewed tactical aircraft.

The NASA study was broken down into two categories: nonflight activities and flight operations. The former category dealt with airline distractions such as PA announcements, paperwork, passenger problems, and other distractions not necessarily related to tactical or operational military flying. The latter category, however, listed distractions relating to all types of flying. Included in this category are the following operational distractions.

Checklist – Accomplishment of the checklist was given a higher priority by aircrews than completing ATC requirements, and every incident of distraction resulted in a potential or actual violation of an ATC rule or regulation. Most problems were caused by completing the checklist while performing other cockpit tasks such as radar monitoring, troubleshooting systems malfunctions, and looking for airborne traffic. The checklist itself became a distraction as part of a compressed cockpit workload, leading to the obvious conclusion that the timing of its completion is critical.

Malfunctions – When a malfunction is of sufficient magnitude that the attention of the entire crew is diverted from

monitoring the aircraft's flightpath, safety is compromised. (This very situation led to the loss of a commercial airliner in the early 1970s, when a nosewheel malfunction, at night, in the airport traffic pattern, diverted the entire crew's attention. The airliner crashed wings level in a marshy area. At the time, the aircraft was on autopilot, and this probably lulled the crew into a false sense of security.) Even if the distraction occupies the full attention of only one pilot or NFO, the valuable crosscheck function is eliminated, and some error may go undetected.

Traffic Watch – A 100 percent attention getter is a radar controller calling out, "Traffic 12 o'clock closing." All eyes in the cockpit are immediately trained dead ahead, and the self-preservation instinct rises. It is doubtful that anything else inside or outside the cockpit gets checked or glanced at until the traffic is spotted. The routine visual traffic watch may not get the undivided attention of the entire crew, but a radar controller's "called" traffic gets the crew's attention fixated so completely that traffic in other directions is ignored. A pilot or crewmember who responds to a traffic callout with a "Roger" without having a visual on the traffic is doing a disservice to both himself and the controller, as it gives the impression that the traffic is in sight even though "Roger" merely means the transmission was received and understood. By all means, let the controller know whether or not you have the traffic in sight.

ATC Communication – ATC communications become distracting when they occur at a time of excessive workload in the cockpit. This includes interruptions from a tower controller when an aircraft has just taken off or is about to land. In either case, the normal habit pattern is interfered with, and that is a common distraction.

New Copilot/NFO – Frequently, pilots or aircraft commanders are required to fly with inexperienced pilots or NFOs. In the process of providing training and instruction or overseeing task performance, a pilot's attention can easily be diverted from his normal duties. He can become so preoccupied with a routine task that he may fail to detect a glaring error caused by another crewmember's inexperience or unfamiliarity with procedures, SOP, or aircraft systems.

Target Fixation – Although this wasn't a distraction listed in the study, it certainly has caused a number of fatal mishaps in naval aviation over the years. The conclusion reached in most mishaps of this type is that the pilot became so fixated on getting a hit with bombs, rockets, or guns that he forgot about the safe pullout altitude until it was too late. With two men in the cockpit, this is less likely to occur than in the single-piloted aircraft, as pullout altitude would certainly be a checklist item for the aviator not controlling the aircraft, but it can happen under any circumstance.

Weather Avoidance – Since it is ingrained into all naval aviators that thunderstorms must be avoided, any impending confrontation with a thunderstorm or severe turbulence is bound to provide some distraction. Of necessity, attention will be diverted outside the cockpit for the purpose of visual storm avoidance. If the aircraft is multicrewed and has a radar aboard, attention inside will probably be concentrated on monitoring the radar to ensure avoidance. On those occasions when an aircraft inadvertently flies into an embedded thunderstorm, the pilot must be absolutely certain that nothing is allowed to distract him from maintaining control of the aircraft until he exits the storm. His attention will be glued to the instruments, and all other tasks should be handled by the copilot/NFO if applicable.

Switchology – One type of distraction that occurs in tactical operations has to do with "switchology." Frequently, on ordnance training flights where bombs or rockets are being expended or during aerial gunnery hops, the wrong frequency setup or the inadvertent activation of the wrong switch will cause a great deal of distraction to a crew. Usually, other aircraft are involved in the mission, and a near-miss or midair is always a possibility if the distraction focuses attention inside the cockpit for too long a time.

This general heading includes channel changes for radios, navaids, IFF, and lighting switches. When activation or movement of a switch, pickle, or button does not produce the expected result, the scene is set for a serious distraction.

Miscellaneous – This covers all other distractions which might prove hazardous to the crew. It would include such things as dropping pencils, flashlights, charts, approach plates, etc. to the deck and the time spent looking for them. Physiological incidents such as hypoxia, sinus blocks, hyperventilation, and nausea all can be extremely distracting. If the individual suffering from such a symptom is in a dual-piloted aircraft, he is fortunate. The unfortunate one is the single pilot who has to make the best of a bad situation. Whenever possible, a single pilot with a physiological problem should get on the mike, make his problem known, and request help.

Today's concept of the multipiloted/crewed tactical aircraft is not a master/slave relationship. It is a joining of two or more professionals, each qualified to perform the mission and each aware of the aircraft, its capabilities, its behavior and, more importantly, when and what to do when the aircraft is operating in an unusual manner. *Get into the habit of checking and doublechecking each other!* Concerted action and backup action are the keys to systematic elimination of hazardous situations brought on by cockpit distractions. ◄

The basis for this article was a study compiled by CAPT William P. Monan while he was assigned to the Aviation Safety Reporting System (ASRS) project for NASA. Results of his study were also reported in PILOT Magazine, a publication of the Canadian Airline Pilots Association; Pilots Safety Exchange Bulletin, a publication of the Flight Safety Foundation, Inc.; and FLIGHT CREW, the International Safety Journal for Corporate/Commuter Aviation. –Ed.

Questions you can't ask a flashlight

Submitted by VA-52

YOU'RE most probably sick and tired of listening to people talk about crew coordination and how critical it is. After all, you fly with the same pilot/NFO all the time, and he knows *exactly* what you want him to do. But are you sure of that? Here are a few things to consider.

Two of the most hazardous areas of carrier aviation are catapult launches and arrested landings. Yet these two events, and the associated movements to and from them, probably receive only cursory coverage in crew-coordination briefs. This abbreviated approach can most definitely work against you in an emergency situation.

An emergency is seldom perceived in the same way by two different people. One will feel more or less stress than the other. The actions of each individual will be a direct result of how he views the emergency and the stress involved. You may be able to talk about it over the ICS, but don't count on it. Even if you can talk, what you may want to say may not be what comes out or what is understood.

Have you ever played the old game where a story is passed around a room, one individual at a time? By the time the story comes back to the originator, any resemblance between the final story and the original is purely accidental. Tell, for example, your B/N that if you lose your instrument lights on a night cat shot, you want him to have a flashlight ready. What did that really tell him? Does he realize what flight instruments you consider critical to keep the aircraft flying in this most important flight evolution? Can you handle bright white lights, or do you want a red lens? Do you expect he will have his flashlight in hand, ready to use, or just in an accessible position? The important thing is that you have to communicate exactly what you want and what you expect.

All potentially stressful situations demand prior discussion and thought. Think about potential emergencies and play the "what if" game, analyzing them in detail. Don't wait until tomorrow – tomorrow may be too late!

letters to the editor

Demon Driver Flight Deck Demeanor

Wildblueyonder, WY – A couple of us old ex-Demon Drivers were reminiscing over a couple of cans of Colorado Coolaid the other evening and thought that, with today's emphasis on NATOPS, you folks back there at *APPROACH* might be interested in this adaptation of an early Readyroom No. 1 handout (with apologies to McDonnell Aircraft, St. Louis, MO).

The following steps are attributable to the F3H-2N community in that period of naval aviation history called "BN" (before NATOPS). They describe procedures to be used on the flight deck (wooden!) of a "27C," but can easily be adapted to the CV(N) operating suite.

- Approach your aircraft with a reckless, devil-may-care attitude, especially at night, as this makes a big impression on flight deck crews. Try not to trip over tiedown chains, as this fails to enhance the initial impression.
- Ask your plane captain what day it is, and mark that down in grease pencil on the nosewheel door. Then ask the plane captain what time it is, and mark that down also. Stow the grease pencil in a convenient place for future use. (Experience has shown the intake duct to be readily convenient *and* accessible, but grease pencil usage has greatly increased recently.)
- Conduct your preflight in a rapid but deliberate manner. Be sure to vigorously kick all the tires. When you come to a complicated part of the airplane, like the wing butt or speedbrake, study it seriously for several seconds before going on. This creates a favorable impression on your plane captain and makes him think you know what you're doing. Try to avoid shaking your head or making deprecating sounds, as this distracts the plane captain.
- When you have finished with the preflight, check the side number of the aircraft, then proceed rapidly to your assigned aircraft and perform steps 1 through 3 all over again.
- To enter the aircraft, approach it from the port side aft and leap lightly onto the trailing edge of the wing.

- Pick yourself up from the deck and climb back gingerly onto the wing. Clutch the canopy in what may best be termed a "vise-like death grip," and step lightly up the goat steps. (Try to control that tense feeling in your gut, and **don't look down.** This is the most difficult portion of the flight and must be executed with precision.) Enter the cockpit in any manner you choose, but if at all possible, try to avoid going in head-first.
- Perform the "disentangling" step, and proceed to sort out and arrange oxygen hoses, radio cords, shoulder straps, hardhats, gloves, kneepads, navigation pubs, anchor chains, inflated liferafts, acey deucy boards, gum wrappers, old issues of *PENTHOUSE*, and any other items that are adrift in the cockpit.
- Arrange all the switches, levers, and buttons in the cockpit in a pleasing and eye-catching manner and prepare to start the engine (if one is available in the aircraft).
- Once the aircraft is started, advance the throttle smartly to the military power stop and stand by for the plane captain's hand signals. When he waves frantically at you, resist the temptation to wave back, and rapidly rearrange the switches, levers, and knobs until the right combination is found, whereupon the plane captain will finally stop waving at you.
- When you receive the signal to taxi, advance the throttle to the afterburner detent and roll smoothly over the chocks. Retard the throttle to military power and try to avoid further use of the afterburner while taxiing, as this irritates flight deck personnel.
- If, after departing the parking spot, you see a row of propeller aircraft in front of you, stop quickly, turn around, and taxi back up the flight deck towards the front of the boat. You have committed a rather serious blunder.
- Upon arriving in the vicinity of the catapult, immediately begin saluting the cat officer frequently and at regular intervals. This accelerates the launching process and gets you airborne a lot quicker. Wait until during the cat power stroke to extend your flaps and slats, as this gives the flight deck checkers a thrill.
- After leaving the bow, rotate the aircraft smartly to a 50-degree noseup attitude, close your eyes, and count to 10. If contact with the water has not been experienced by that time, open your eyes and continue the mission as briefed.

LT Wally Neeb
LTJG Angelo Pretori
Formerly of VF-193

Contributors Wanted

APPROACH is always interested in contributed articles and photos. To save you time and increase the chances of your contribution being published, we have printed a Contributor's Guide. For a free copy of this handy booklet, please write to: Naval Safety Center, Safety Publications Dept. (Code 7531), NAS Norfolk, VA 23511 or call Autovon 690-1321.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: ***APPROACH*** Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

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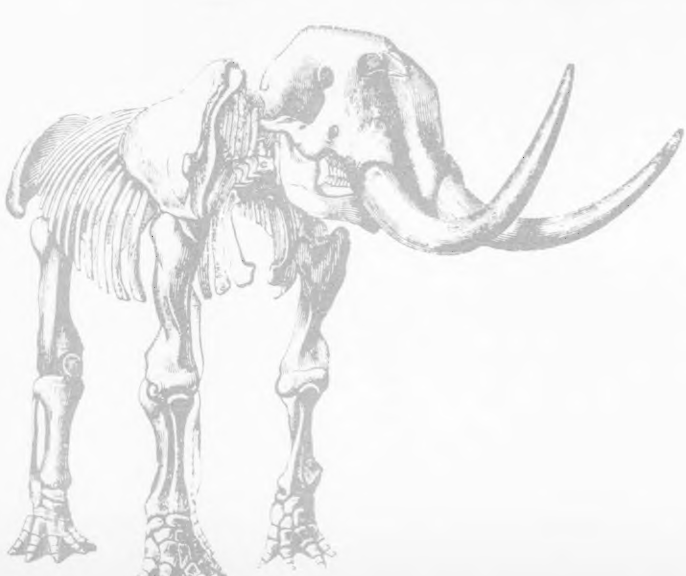
Don't wait until it's <u>too late</u> to bone up on emergency procedures.



Naval Safety Center
NAS Norfolk, Virginia

That's a promising cold you have there.

With a little neglect it can

become

a

beaut.

...just don't fly with it.

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